REMARKS

In the Official Action dated October 17, 2005, the Examiner rejected Claims 1-6 under 35 U.S.C. §103(a), as allegedly unpatentable over U.S. Patent No. 3,382,066 (Kenney et al). in view of U.S. Patent No. 6,103,392 (Dorfman et al).

This response addresses each of the Examiner's objections and rejections. Accordingly, the present application is in condition for allowance. Favorable consideration of all pending claims is therefore respectfully requested.

Applicants have cancelled claims 7-8 in a previous Response to an Office Action issued by the U.S.P.T.O. However, Applicants have not abandoned the subject matter in claims 7-8 and reserve the right to file a continuation application directed thereto.

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Claim 1 of Applicants' invention relates to a method for fabricating W-Cu alloy having a homogenous micro-structure, comprising forming mixed powders by mixing tungsten powders with W-Cu composite powders; forming a compact by pressurizing-forming the mixed powders; forming a skeleton by sintering the compact; and contacting copper to the skeleton and performing infiltration. As a result of the use of tungsten powders and W-Cu composite powders as starting materials, when the Cu in the W-Cu composite powders is melted in the sintering step, it is capable of being moved into a space among the adjacent W powders by a capillary force. See page 7, lines 1-2. The moved Cu gives strength to the skeleton of W powders and W-Cu powders and copper can easily impregnate through the skeleton in the following infiltration method. See page 7, lines 2-5. The empty sites in the W-Cu composite promote copper

infiltration into the skeleton in the infiltration process. The tungsten in the W-Cu composite powers is solid phase-sintered with adjacent W powders to form a strong networking structure. The method of claim 1 is particularly advantageous because the claimed method prevents a generation of a copper rich region by contacting copper to the skeleton, which is formed from the tungsten powder and W-Cu composite powder starting materials, and performing infiltration with the copper. (See page 7, lines 8-9 of the specification). As a result, the method of claim 1 produces a product that has a uniform microstructure with good properties. These results are achievable through the use of W powder and W-Cu composite powder as starting materials for W-Cu alloys and the subsequent steps in the process of the present invention.

Kenney et al. and Dorfman et al. do not disclose or suggest either alone or in combination, Applicants' claimed method nor do they teach, disclose or suggest a product of the present invention. These are differences between the process of the present invention and the combination of the teachings of the prior art. For example, neither Kenney et al. nor Dorfman et al. teach, disclose or suggest the step of using tungsten powder and W-Cu composite powder as starting material for a W-Cu alloy. Kenney et al. disclose blending tungsten oxide and cuprous oxide powders in predetermined proportions and reducing the blended oxides. The copper tungsten mix can then be compacted, sintered and infiltrated. See Column 2, lines 22-35 of Kenney et al.

Dorfman et al. do not correct the deficiencies of Kenney et al. Instead, Dorfman et al. disclose that a W-Cu composite can be made from particles having a copper tungstate phase and a tungstate trioxide phase, particularly $CuWO_4$ and WO_3. See Column 4, lines 41-67.

The method, as defined in claim 1, differs, for example, from the combination of Kenney et al. and Dorfman et al. by using tungsten powder and W-Cu composite powder as starting material for the W-Cu alloy. This is vastly different from the tungsten oxide and cuprous oxide powders starting materials used in Kenney et al., and the $CuWO_4$ and WO_3 starting materials used in Dorfinan et al. Kenney et al. and Dorfman et al, alone or in combination, do not disclose or suggest using tungsten powder and W-Cu composite powder as starting material for the W-Cu alloy.

In addition, the claimed method is particularly advantageous over Kenney et al. and Dorfinan et al. wherein the claimed method of the present invention prevents the formation of a copper rich region in the skeleton by utilizing W and W-Cu composite powders in the starting materials, forming a compact, then forming a skeleton by sinster of the compact, which melts the Cu in the W-Cu powders and permitting the Cu to move into a space in the adjacent W powder, then contacting copper to the skeleton and performing infiltration of the resulting product. As a result, the claimed method produces a product that has a uniform microstructure with good properties. On the other hand, neither Kenney et al. nor Dorfinan et al alone or in combination teach, disclose or suggest the advantage achieved by the present process, e.g., the prevention of a Cu-rich region in the W-Cu alloy. A review of both Kenney et al and Dorfman et al reveals that both citations are completely silent as to forming the networking structure of the present product, which prevents generating a Cu-rich region (Cu pool) in the skeleton structure. Thus, the combination of the methods in the cited references does not recognize these advantages of the present process. Moreover, the methodology of Kenney et al. and Dorfinan et al. results in a product with a Cu rich region during an additional Cu infiltration since the combined teachings of these two references do not suggest or disclose combining W powders and W-Cu composite

powders as required by the claimed invention.

Furthermore, Dorfman et al. do not suggest or motivate one skilled in the art to make the necessary modifications in Kenney et al. in order to arrive at Applicants' claimed invention. There is no teaching or suggestion, for example, in substituting the tungsten oxide and cuprous oxide powders after Kenney et al. for the tungsten powder and W-Cu composite powder, as used in the present invention. Accordingly, Claim 1 and dependent claims 2-6 are patentable over Kenney et al. and Dorfman et al.

These arguments are also applicable to Claims 2-5, and are incorporated herein by reference.

However, claim 2 further distinguishes the claimed method over the combination of Kenney et al. and Dorfman et al. Specifically, by following the methodology in Claim 2, the W-Cu composite formed has a specific round structure wherein the W powder surrounds the Cu powder. This result is due to using a mixture of WO_3 and WO_2 with a copper oxide powder comprised of a mixture of CuO and Cu_2O. The W powder surrounding the Cu powder is another highly advantageous feature of the claimed invention over the cited references since there is no generation of intermediates or contamination of impurities. Dorfman et al, and Kenney et al. do not disclose or suggest a specific round structure wherein the W powder surrounds the Cu powder, nor do they suggest alone or in combination the use of a mixture of WO_2 and WO_3 in the copper oxide powder comprised of a mixture of Cu O and Cu_2O as recited in Claim 2.

Thus, for the reasons provided herein, the rejection of Claims 1-6 under 35 U.S.C. §103(a) is obviated. Applicants respectfully request reconsideration and withdrawal of this rejection under 35 U.S.C. §103(a).

Thus, in view of the foregoing remarks, it is respectfully submitted that the application is in condition for allowance, which action is earnestly solicited.

Respectfully submitted,

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